AN ARRANGEMENT FOR CUTTING AN OPTICAL FIBRE

TECHNICAL FIELD

The invention relates generally to optical fibres and more specifically to an arrangement for cutting such fibres.

BACKGROUND OF THE INVENTION

Today, optical fibres are cut by means of hand-operated fibre cutters. Such cutters comprise a fixture for receiving a fibre as well as mechanical means for tensioning, bending and nicking the fibre.

With such a hand-operated cutter, it is impossible for an operator to ensure successive identical cuts. Also, it will be necessary to frequently readjust the cutter due to the rough treatment of the cutter by the operator.

SUMMARY OF THE INVENTION

The object of the invention is to bring about an arrangement for automated cutting of optical fibres to secure successive identical cuts.

This is attained by the arrangement according to the invention in that a motor is provided to operate the cutter. The motor is controlled to start a cutting movement in response to a start signal from a control unit. The start signal is generated when the fibre is located in the cutter. A detector is connected to the control unit to detect snap off of the fibre and in response hereto cause the control unit to generate a stop signal to stop the cutting movement. The cutting movement is automatically stopped at a predetermined position if no fibre snap off is detected.

By running the motor repeatedly at the same speed, the same cutting force will be applied to successive fibres. Hereby, identical cuts will be secured.

BRIEF DESCRIPTION OF THE DRAWING

The invention will be described more in detail below with reference to the appended drawing on which Fig. 1 is a schematic block diagram of an embodiment of an arrangement according to the invention.

DESCRIPTION OF THE INVENTION

Fig. 1 is a schematic block diagram of an embodiment of an arrangement according to the invention for cutting an optical fibre 1.

The fibre 1 is received in a fibre cutter, e.g. a known hand-operated cutter. In a manner known per se, the cutter comprises a fixture 2 and a handle 3 pivoted to the fixture 2 for pressing the fibre 1 towards mechanical tensioning, bending and nicking means (not shown) in the fixture 2 in order to cut the fibre 1. The fibre 1 can be placed in the fixture 2 by means of e.g. a robot arm (not shown).

In accordance with the invention, the handle 3 of the cutter is operated by a motor and not by hand.

In the embodiment shown in Fig. 1, the handle 3 is operated by a shaft 4 of a linear motor 5 via a lever 6 that is pivoted around a spindle 7. The ends of the lever 6 are provided with rollers such that a roller 8 is in contact with the end of the shaft 4 of the linear motor 5, and a roller 9 is in contact with the top side of the handle 3 of the cutter.

Thus, when the linear motor 5 runs and the shaft 4 of the linear motor 5 rises, the handle 3 is pressed down towards the fibre 1 via the roller 9 and vice versa.

The operation of the linear motor 5 is controlled by an output signal from a control unit 10. The control unit 10 is adapted to initiate a cutting movement in response to a start signal S from an operator or a robot when the fibre 1 to be cut has been placed in the fixture 2.

A sensor 11 is provided to continuously sense the position of the shaft 4 of the linear motor 5. The sensor 11 is connected to the control unit 10 to transfer information about the position of the shaft 4 to the control unit 10.

To control the operation of the linear motor 5 and thereby indirectly the operation of the handle 3 in accordance with the invention, a detector 12 is provided to detect when the fibre 1 snaps off when cut. Preferably, the detector 12 is located on the fixture 2.

In a preferred embodiment, the detector 12 is an acoustic detector, e.g. a microphone that is adapted to detect a snap off sound when the fibre 1 snaps off.

The detector 12 can comprise an amplifier and a band-pass filter (not shown) and is adapted to generate an output signal only upon a snap off sound relating to the snap off of the fibre 1.

The detector 12 is connected to the control unit 10 that in response to the output signal of the detector 12 is adapted to immediately stop the linear motor 5 to stop the cutting movement of the handle 3.

If no snap off sound is detected by the detector 12 in connection with a cutting movement, the sensor 11 on the motor 5 is adapted to generate an output signal to the control unit 10 at a predetermined position of the shaft 4. In response to this output signal, the control unit 10 is adapted to immediately stop the motor 5.

As should be apparent from the above, successive identical cuts can be made with the arrangement according to the invention.